

*Sub  
A1*

What is claimed is:

1. A storage system that stores data from a host system, the storage system comprising:
  - 2 a housing;
  - 4 a plurality of disk drives positioned within the housing; and
  - 6 a controller that controls the disk drives, wherein at least two of the disk drives are in different modes during the transfer of data to at least one of the disk drives.
2. The storage system of claim 1 wherein the controller directs data to a first subset of disk drives and a second subset of disk drives simultaneously.
3. The storage system of claim 2 wherein at least one of the subsets includes five disk drives.
4. The storage system of claim 2 wherein the controller directs the data to each subset using parity protection.
5. The storage system of claim 1 wherein at least one third of the disk drives are in a stand-by mode during the transfer of data to at least one of the disk drives.
6. The storage system of claim 1 wherein at least one half of the disk drives are in a stand-by mode during the transfer of data to at least one of the disk drives.
7. The storage system of claim 1 wherein at least two thirds of the disk drives are in a stand-by mode during the transfer of data to at least one of the disk drives.

8. The storage system of claim 1 further comprising a first drive rail  
2 that retains the disk drives, wherein the disk drives are arranged in a first row of  
disk drives and a second row of disk drives, and wherein the disk drives in the  
4 first row are in a write/read mode and the disk drives in the second row are in a  
standby mode at approximately the same time.

9. The storage system of claim 1 further comprising a first drive rail  
2 that retains the disk drives, wherein the disk drives are arranged in a first row of  
disk drives, a second row of disk drives, and a third row of disk drives, and  
4 wherein the disk drives in the first and second rows are in a write/read mode  
and the disk drives in the third row are in a standby mode at approximately the  
6 same time.

10. The storage system of claim 1 further comprising a first drive rail  
2 that retains the disk drives, wherein the disk drives are arranged in a first row of  
disk drives, a second row of disk drives and a third row of disk drives, and  
4 wherein the disk drives in the first row are in a write/read mode and the disk  
drives in the second and third rows are in a standby mode at approximately the  
6 same time.

11. The storage system of claim 1 wherein the disk drives are  
2 arranged into six rows of disk drives, and wherein the disk drives in two of the  
rows are in a write/read mode and the disk drives in four of the rows are in a  
4 standby mode at approximately the same time.

12. The storage system of claim 1 wherein each of the disk drives are  
2 in the standby mode when data is not being transferred to the disk drives.

13. A combination comprising a host system and the storage system  
2 of claim 1.

14. A storage system that stores data from a host system, the  
2 storage system comprising:

4 a first rail assembly including a plurality of disk drives arranged in  
at least two rows; and

6 a controller that controls the disk drives, wherein the disk drives in  
one of the rows are in a stand-by mode and the disk drives in one of the  
rows are in a write/read mode at approximately the same time.

15. The storage system of claim 14 wherein the disk drives are  
2 arranged in three rows, and wherein the disk drives in two of the rows are in  
the stand-by mode and the disk drives in one of the rows are in the write/read  
4 mode at approximately the same time.

16. The storage system of claim 14 wherein the disk drives are  
2 arranged in three rows, and wherein the disk drives in two of the rows are in  
the write/read mode and the disk drives in one of the rows are in the standby  
4 mode at approximately the same time.

17. The storage system of claim 14 wherein one third of the disk  
2 drives are in the stand-by mode and two thirds of the disk drives are in the  
write/read mode at approximately the same time.

18. The storage system of claim 14 wherein one half of the disk  
2 drives are in the stand-by mode and one half of the disk drives are in the  
write/read mode at approximately the same time.

19. The storage system of claim 14 wherein two thirds of the disk  
2 drives are in the stand-by mode and one third of the disk drives are in the  
write/read mode at approximately the same time.

20. The storage system of claim 14 further comprising a first drive rail  
2 that retains the disk drives, wherein the disk drives are arranged in a first row of  
4 disk drives and a second row of disk drives, and wherein the disk drives in the  
first row are in the write/read mode and the disk drives in the second row are in  
the standby mode at approximately the same time.

21. The storage system of claim 14 further comprising a second rail  
2 assembly including a plurality of disk drives arranged in at least two rows and  
4 wherein the disk drives in one of the rows of the second rail assembly are in  
the standby mode and the disk drives in one of the rows of the second rail  
assembly are in the write/read mode at approximately the same time.

22. A combination comprising a host system and the storage system  
2 of claim 14.

23. A storage system that stores data from a host system, the  
2 storage system comprising:  
4 a housing;  
6 a first rail assembly positioned within the housing, the first rail  
assembly including a plurality of disk drives arranged in three rows;  
8 a second rail assembly positioned within the housing, the second  
rail assembly including a plurality of disk drives arranged in three rows;  
10 and  
a controller that controls the disk drives, wherein the disk drives in  
four of the rows are in a stand-by mode and the disk drives in two of the  
rows are in a write/read mode at approximately the same time.

24. The storage system of claim 23 wherein the disk drives that are in  
2 the write/read mode are part of the first rail assembly.

25. The storage system of claim 23 wherein one of the rows of the  
2 disk drives that are in the write/read mode are part of the first rail assembly and  
one of the rows of the disk drives that are in the write/read mode are part of the  
4 second rail assembly.

26. The storage system of claim 23 wherein each row includes five  
2 disk drives.

27. The storage system of claim 23 wherein the first rail assembly  
2 includes a first drive rail that retains the disk drives of the first rail assembly and  
the second rail assembly includes a second drive rail that retains the disk  
4 drives of the second rail assembly.

28. The storage system of claim 23 wherein each of the disk drives  
2 are in the standby mode when data is not being transferred to the disk drives.

29. A combination comprising a host system and the storage system  
2 of claim 23.

30. A method for storing data from a host system, the method  
2 comprising the steps of:

4 providing a plurality of disk drives positioned within a housing;  
and  
6 controlling the disk drives so that at least two of the disk drives  
are in different modes during the transfer of data.

31. The method of claim 30 wherein the step of controlling the disk  
2 drives includes simultaneously directing data to a first subset of disk drives and  
a second subset of disk drives.

32. The method of claim 30 wherein the step of controlling the disk  
2 drives includes placing at least one third of the disk drives in a stand-by mode  
during the transfer of data.

33. The method of claim 30 wherein the step of controlling the disk  
2 drives includes placing at least one half of the disk drives in a stand-by mode  
during the transfer of data.

34. The method of claim 30 wherein the step of controlling the disk  
2 drives includes placing at least two-thirds of the disk drives in a stand-by mode  
during the transfer of data.

35. The method of claim 30 wherein the step of providing a plurality  
2 of disk drives includes the step of arranging the disk drives into at least two  
rows, and wherein the step of controlling the disk drives includes placing the  
4 disk drives in at least one of the rows in a write/read mode and the disk drives  
in at least one of the rows in a standby mode at substantially the same time.

36. The method of claim 30 the step of providing a plurality of disk  
2 drives includes the step of arranging the disk drives into at least three rows,  
and wherein the step of controlling the disk drives includes placing the disk  
4 drives in at least two of the rows in the write/read mode and the disk drives in  
at least one of the rows in the standby mode at substantially the same time.

37. The method of claim 30 wherein the step of providing a plurality  
2 of disk drives includes the step of arranging the disk drives into at least three  
rows, and wherein the step of controlling the disk drives includes placing the  
4 disk drives in at least one of the rows in a write/read mode and the disk drives  
in at least two of the rows in a standby mode at approximately the same time.

38. The method of claim 30 wherein the step of providing a plurality  
2 of disk drives includes the step of arranging the disk drives into six rows, and  
wherein the step of controlling the disk drives includes placing the disk drives in  
4 two of the rows in a write/read mode and the disk drives in four of the rows in  
the standby mode at approximately the same time.